

Influences of the Home Environment and Daily Routines on Sleep and Obesity

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Overview of Presentation

- Obesity
- Link between sleep and obesity
- The home environment and routines
- Implications

Childhood Obesity Trends



- Since 1980, child obesity rates have tripled
- 17% of children and adolescents are obese
 - Obesity rates increase across childhood
- 15% low-income preschool-aged children are obese
- Racial and ethnic disparities
 - Highest rates (Ogden et al., 2010)
 - Hispanic boys
 - 26.8% compared to 16.7% for NH white boys
 - African American girls
 - 29.2% compared to 14.5% for NH white girls

<http://www.cdc.gov/obesity/data/childhood.html>

Childhood Obesity Outcomes



- **Stability of obesity** (CDC.Gov website; Parsons et al., 1999)
- **Parent BMI** (Parsons et al., 1999)
- **Associated health risks**
 - Asthma
 - Type 2 Diabetes
 - Heart disease
 - High blood pressure
 - Sleep problems
 - Social discrimination
- **Stigma and self-esteem**
 - Academic and social functioning
 - Persist into adulthood
- **Adiposity rebound in children** (Rolland-Cachera et al., 2012)
 - Begins around age 6; worse if rebound before 5.5 years



Influences on Child Obesity

Family /Home Environment

Family food environment

Parent work schedules

Parental education

Family Interactions

Mealtime climate

Parent routines

Parent race

Family SES

Parent BMI

Family

Child

Child

Race

Gender

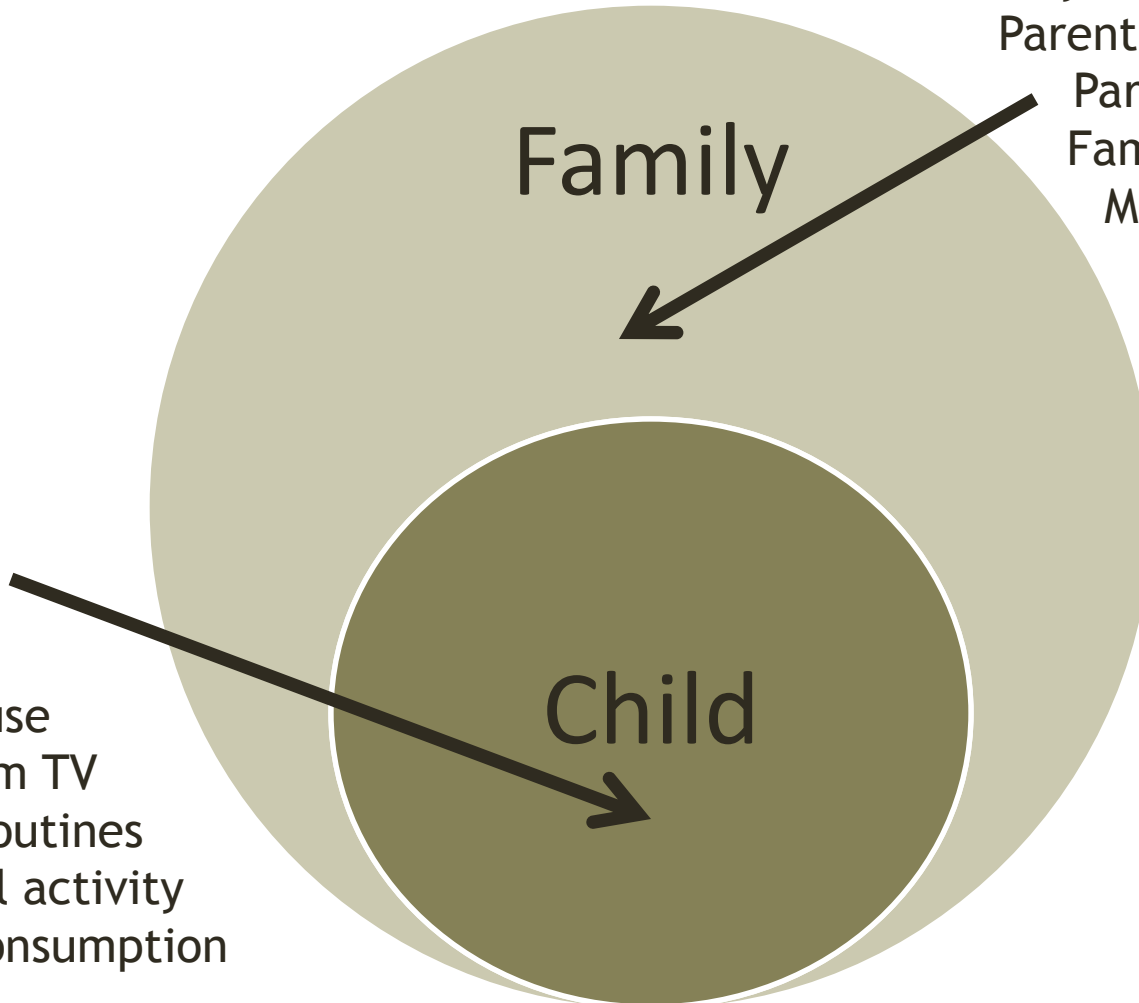
Media use

Bedroom TV

Sleep routines

Physical activity

Food consumption





Sleep and Obesity

- Prevalence of childhood sleep problems
 - Range from 20-41% of children (just reported)
(Archbold et al., 2002; Mindell et al., 1999; Owens et al., 2000)
- Insufficient sleep linked to obesity (Chaput et al., 2006; Chen et al., 2002; Gupta et al., 2002; Snell et al., 2007; Taveras et al., 2008)
- Sleep problems tend to be chronic (Kataria et al., 1987; Pollock, 1994)
- Inconsistent routines relate to sleep problems (Mindell et al., 2009)
- Similar to obesity, racial/ethnic minorities more likely to experience insufficient sleep starting as infants (Nevarez et al., 2010)
- So why might sleep and obesity be linked together?
- Routine of insufficient sleep creates a vicious cycle
 - Body craves more energy-dense foods to keep going
 - BMI increases, leading to decline in sleep quality
 - Hormones are affected, changing metabolism
 - Melatonin , Cortisol, Leptin, Ghrelin, Insulin
(e.g., Prinz, 2004; Taheri et al., 2004)

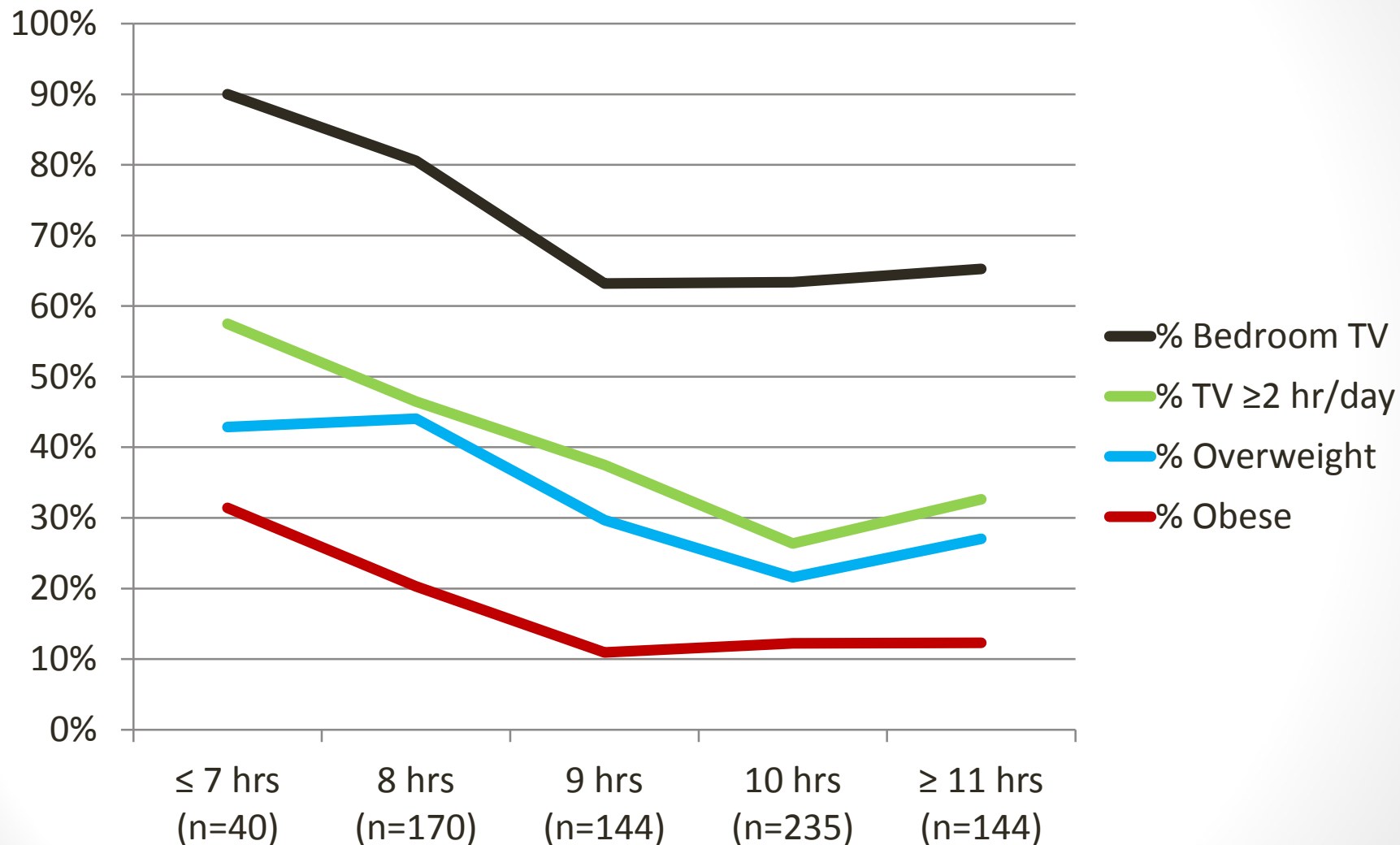


Sleep and Obesity

- Links in preschool children
- **Study 1** — (Dev, McBride, Fiese, Jones, & Cho, 2013)
 - Analysis of 22 previously identified risk factors for child obesity
 - Of the 22 entered in the model, only 3 were significant
 - Child Sleep (OR = 2.2)
 - Parent BMI - Parent was Obese (OR = 1.9)
 - Restrictive Feeding Practices (OR = 1.75)
- **Study 2** — (Jones, Fiese, & the STRONG Kids Team, in press)
 - Children who did not get at least 10 hours of sleep per night were 2.87 times more likely to be classified as “at-risk-for-overweight” or obese (BMI \geq 85th percentile)
 - After controlling for gender, age, race, SES, parent BMI, parent education, and single-parent households

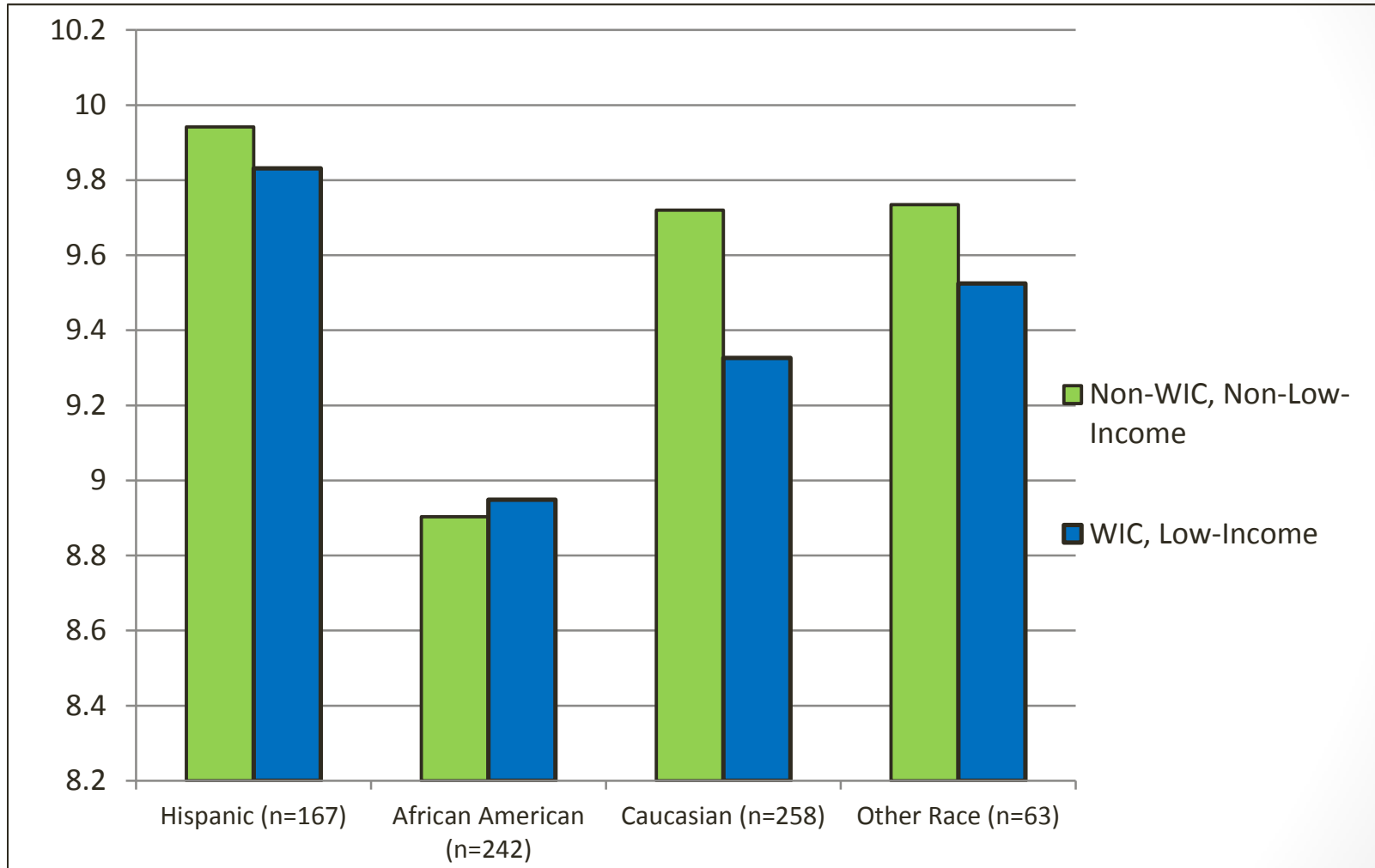


Child Sleep Duration Results



Adjusted for child gender, child age, child race, parent education, and SES

Sleep Differences by Race and SES



Note: $N = 730$. After controlling for child age, child gender, and parent education, there were significant differences across race for average sleep hours per night, $F(3, 719) = 8.087, p < .001$



Bedroom TVs and Obesity

- **Bedroom TVs related to:**

- Increased TV viewing (Barr-Anderson et al., 2008)
- Poor educational achievement
(Barr-Anderson et al., 2008)
- Decreased sleep duration
(Mindell et al., 2009; Owens et al., 1999)
- Fewer family meals
(Barr-Anderson et al., 2008)
- Decreased physical activity (Barr-Anderson et al., 2008)
- Differences in race and other demographics
(Dennison et al., 2002)
- Increased BMI (Dennison et al., 2002)



Bedroom TV Prevalence

2001 - American Academy of Pediatrics recommendations

“Children, Adolescents, and Television”

- “Limit children’s total media time to no more than 1 to 2 hours of quality programming per day.”
- “Remove television sets from children’s bedrooms.”

In 1999, 32% of 2-to-7-year-olds had a BTV (Roberts et al., 1999)

By 2002, 38% of preschool children had a BTV (Dennison et al., 2002)

As of 2014, 60% of adolescents had a BTV.

- Associated with 1 pound gain per year
(Gilbert-Diamond et al., 2014)

However, few studies have followed up
on BTV prevalence for preschool children



Bedroom TV Findings

Our study included 2-to-4-year-old children ($n=743$)

- 69.2% of children had bedroom TVs
- 32% at time of the 2001 AAP recommendations

Presence of a bedroom TV associated with:

- Family income
- Child age, gender, and race
- TV viewing hours/day
- Sleep hours/day

Bedroom TV Prevalence by Race

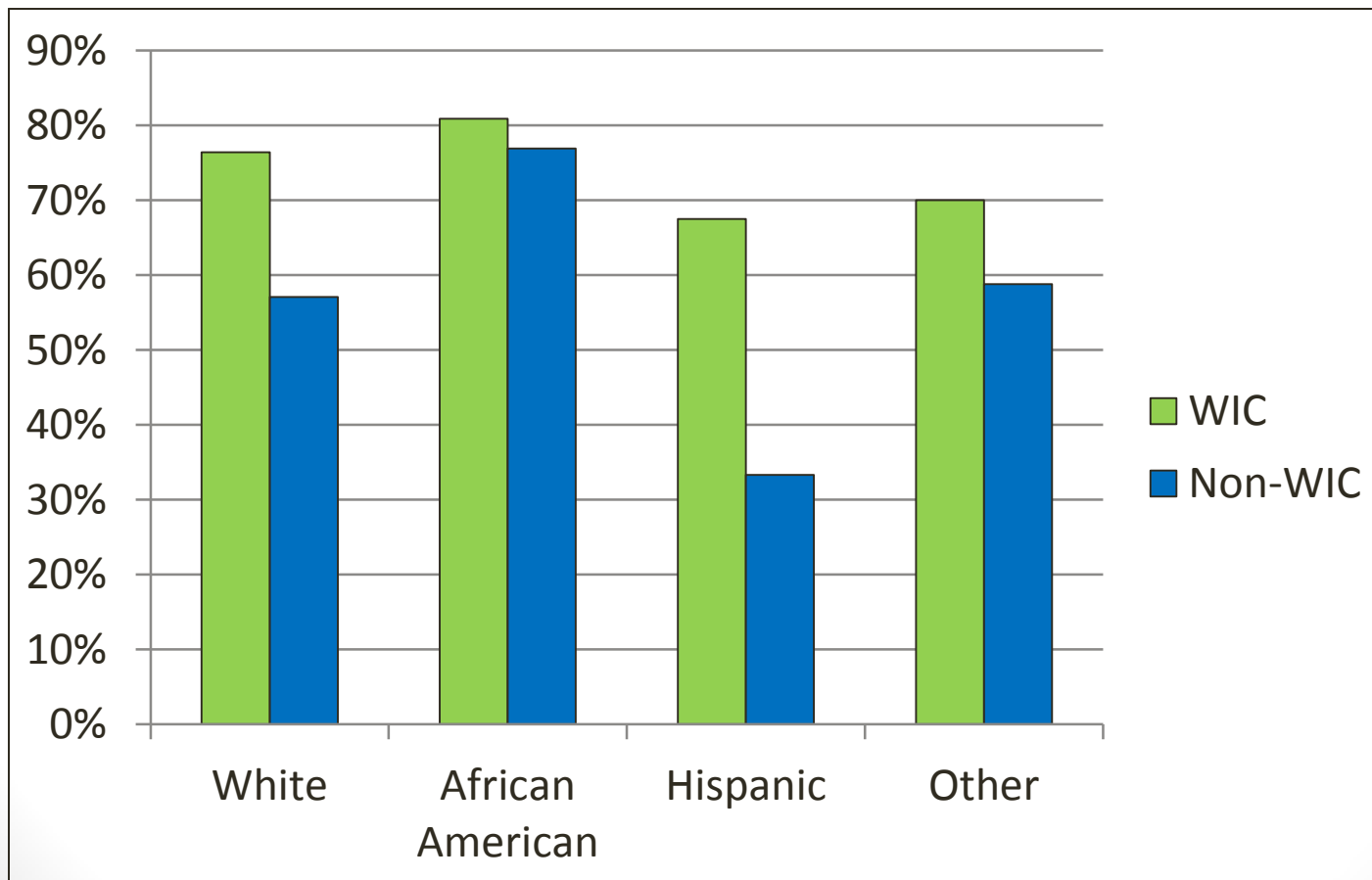


Children using WIC were more likely to have a BTV

- $\chi^2 = 20.582$, $p < .001$

African American children were more likely to have a BTV

- $\chi^2 = 21.870$, $p < .001$



Bedroom TVs Results



Variable	BTV	No BTV
TV viewing hours/day	1.9 hours**	1.6 hours
% viewed TV \geq 2 hours/day	38.8%*	29.6%
Sleep hours/night	9.3 hours**	9.7 hours
% sleep < 10 hours/night	51.2%*	41.6%
Overweight (BMI >85 th percentile)	30.4%	28.0%
Obese (BMI > 95 th percentile)	15.2%	12.6%

Note: Using ANOVA tests, we controlled for child gender, child age, child race, parent education level, and SES. * $p < .05$, ** $p < .01$



Implications

~Child sleep is often insufficient

- **Supports previous research for 10 hour minimum (2-4y)**

(Bell et al., 2010; Jiang et al., 2009; Parenting Science website)

~Too many children have bedroom televisions

~Family mealtimes are important and we need to limit distractions

Targets for intervention

- Encourage children and adolescents to get enough sleep, focusing on sleep routines and environments
- Remove bedroom TVs (easily modifiable risk behavior)
- More efforts are needed that focus on helping children from minority and low-income families
- Encourage family mealtimes with less distractions

Food/Mealtime Environments

Food consumption is associated with:

- Household and food environments
- Attention
- Stress perceptions
- Availability of healthy foods in the home

***USDA recommendations for mealtimes with children**

healthymeals.nal.usda.gov/hsmrs/.../Action.../CCAG_Section5.pdf

Avoid rushed/hurried meals

Mealtimes should be pleasant & relaxed

Family style feeding - children learn to regulate feeding

Make mealtimes a predictable routine

Parents and adults should model healthy eating

- **Family EATS study - (Kong, Jones, Fiese et al., 2013)**
 - Family mealtime interactions differ by race in low-income families

Attention, Stress, and Eating



Attention

- **TV & other non-food environmental stimuli related to almost 300 more calories consumed during meals** (e.g., Bellisle, Daliz, & Slama, 2004; Stroebele & DeCastro, 2004)
- **“Mindless Eating” studies** (Brian Wansink)

Perceived Stress

- **Increased sweets consumption** (Epel et al., 2001)
- **More snacking & less “meal-type” foods** (Oliver & Wardle, 1999)
- **Increased fat consumption** (Torres & Nowson, 2007)
- **Gender Differences in perceived stress and food consumption**
 - **Women ate more sweets & calories** (Epel et al., 2001)
 - **Perceived stress related to increased consumption of sweets and decreased consumption of vegetables for women, but not for men** (Mikolajczyk et al., 2009)



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